Applied Demography: Some Texas Examples

University of Texas at Austin
Division of Statistics + Scientific Computation
Statistics in Action Series

February 6, 2013
Austin, TX

OFFICE OF THE STATE DEMOGRAPHER

Demography – the study of the size, distribution, and composition of populations; the processes determining these – namely, fertility, mortality, and migration; and the determinants and consequences of all of the above.

~ Bogue, 1968; Murdock & Ellis, 1991

The Population Research Institute,

2.1 Kids: Stable Population

http://youtu.be/zBS6f-JVvTY

Mission

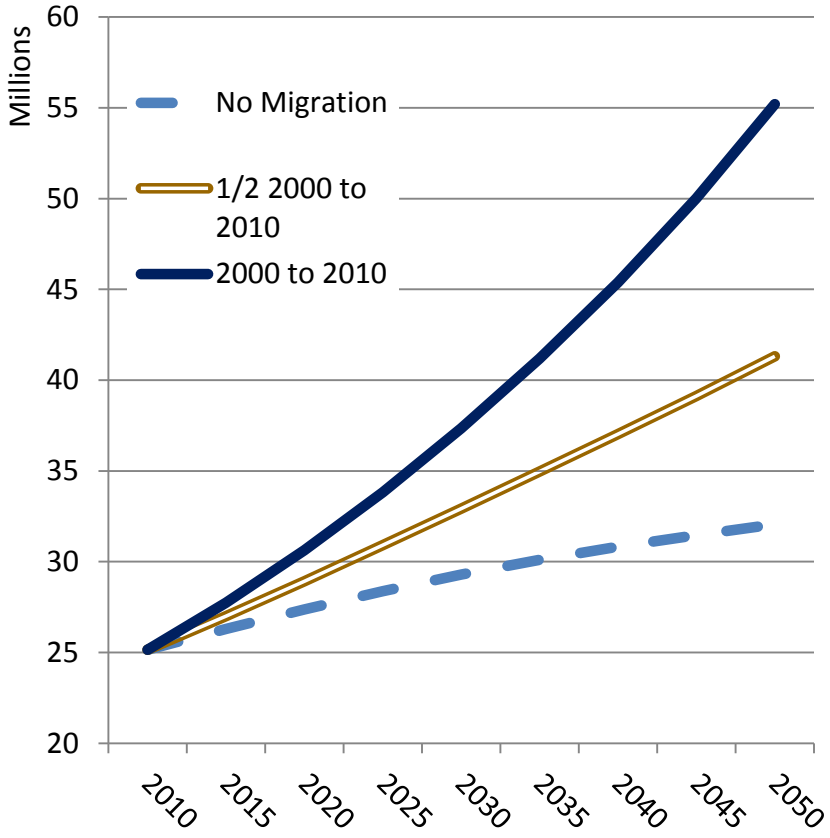
The Office of the State Demographer disseminates demographic and related socioeconomic data to the State of Texas and the general public. The State Demographer's Office monitors demographic and socioeconomic changes in the State in order to better inform the executive and legislative branches of Texas government. Special emphasis is placed on data that may be useful to policy makers in dealing with issues regarding the demand for state services.

Meeting the Mission

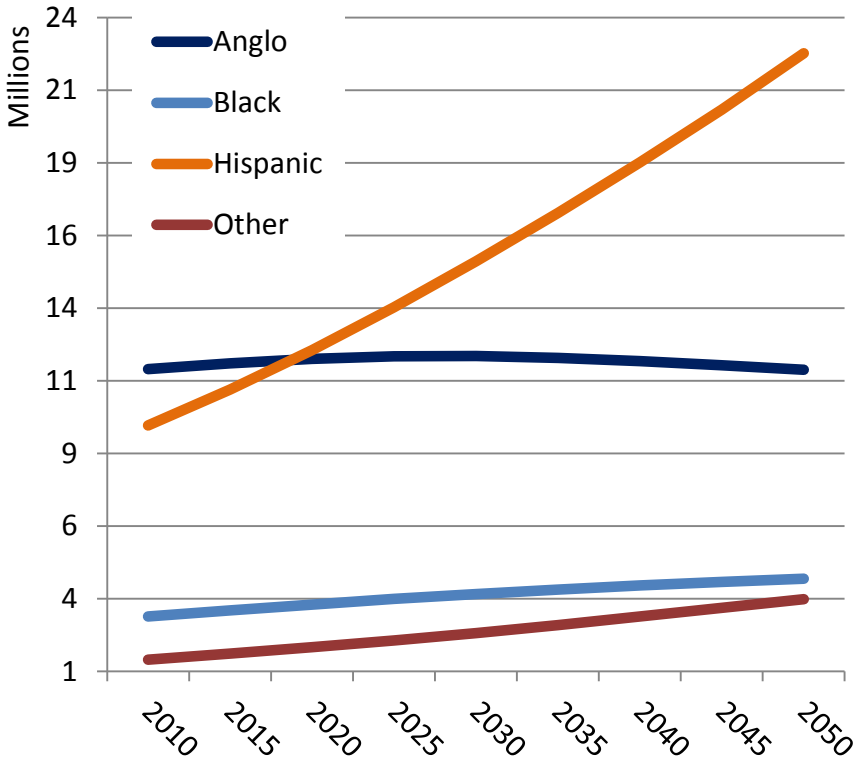
- Data Portal, Publications, and Reports
  http://txsdc.utsa.edu/
- Population Estimates and Projections Program
  http://txsdc.utsa.edu/Data/TPEPP/Estimates/Index.aspx
- Resource Witness at Legislative Hearings
- Public Presentations
  http://osd.state.tx.us
- Data Requests
- Custom Research Projects
- Annual Conference for Data Users and Applied Demography Conference

Population Projections, 2010

Projected Population in Texas, 2010 to 2050



Projected Population for Texas by Race/Ethnicity, 2010 to 2050, 0.5 Migration Scenario



Source: Texas State Data Center Population Estimates and Projections Program, 2010 Projections

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Three Examples of Applying Demographic Data and Methods to Government & Business Planning

Projecting the educational attainment of the Texas labor force

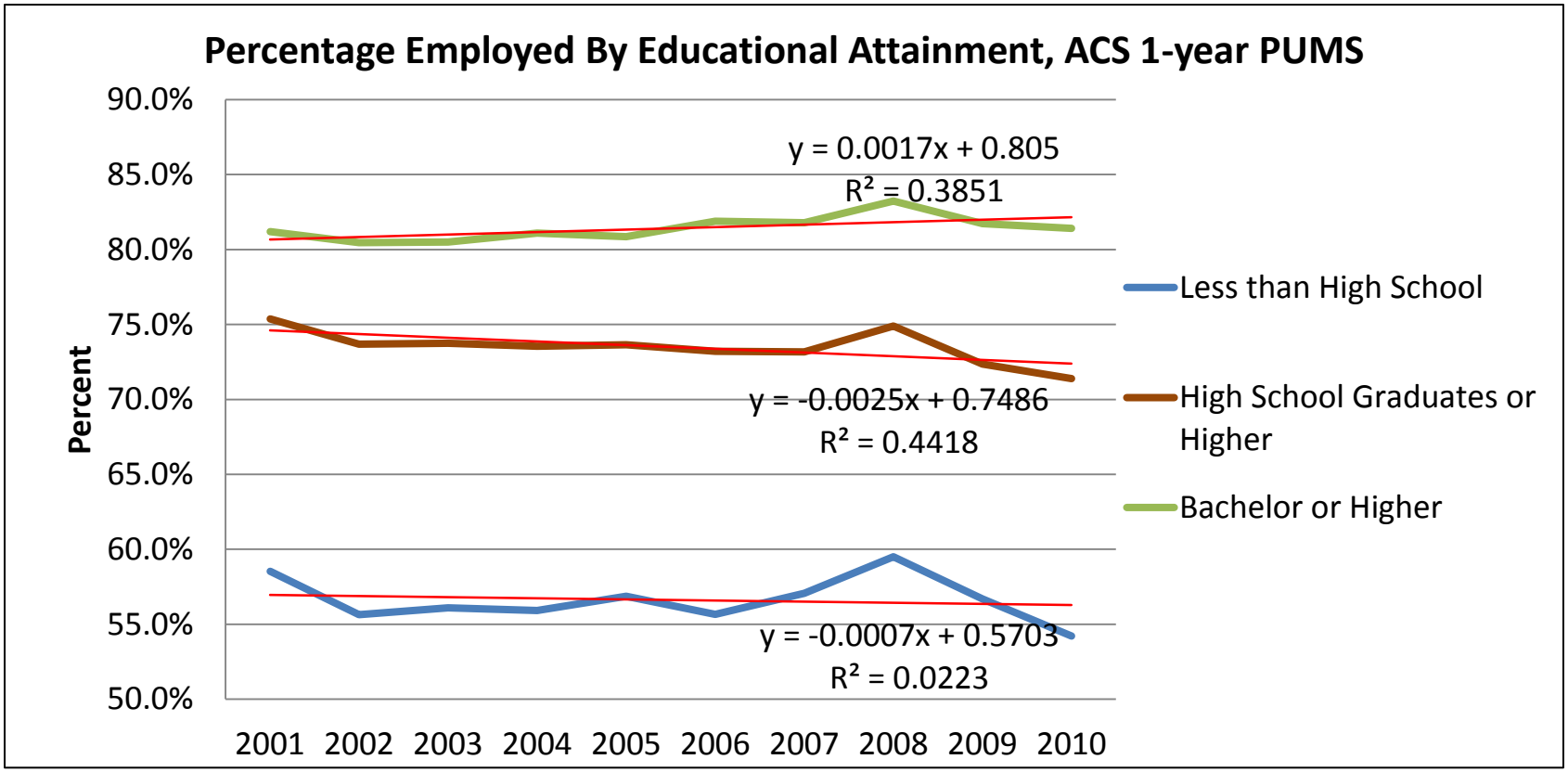
Background

- Texas educational attainment ranked the lowest among the 51 states
  - 51st in high school graduation
  - 37th in college graduation

Source: U.S. Census Bureau. 2006-2010 American Community Survey PUMS data

Background

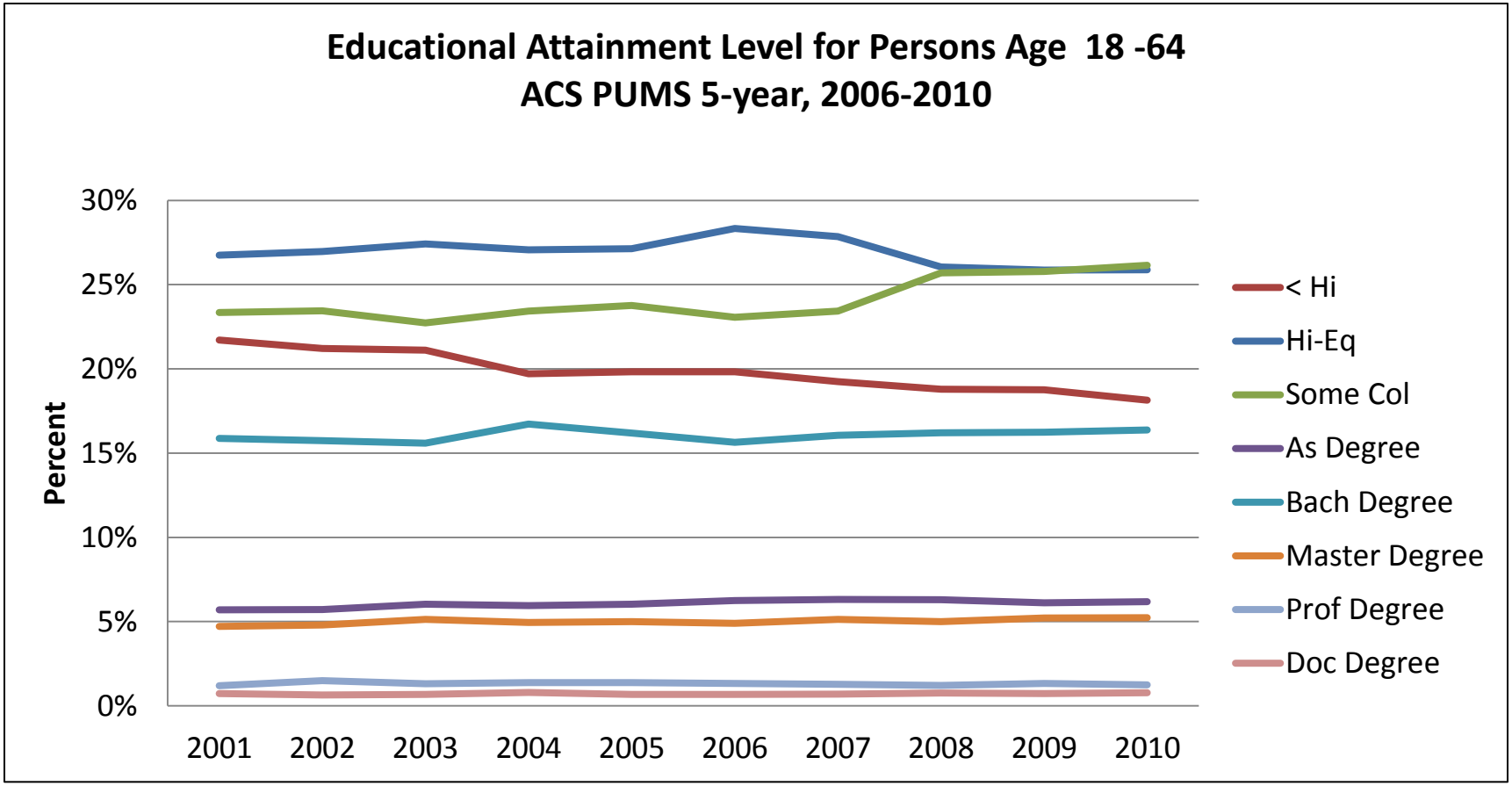
Individuals with some higher education are more likely to be employed; trend suggests this gap may be widening.



Source: U.S. Census Bureau. 2001 to 2010 American Community Survey 1-Year PUMS data

Background

Educational attainment has improved in the last 10 years.

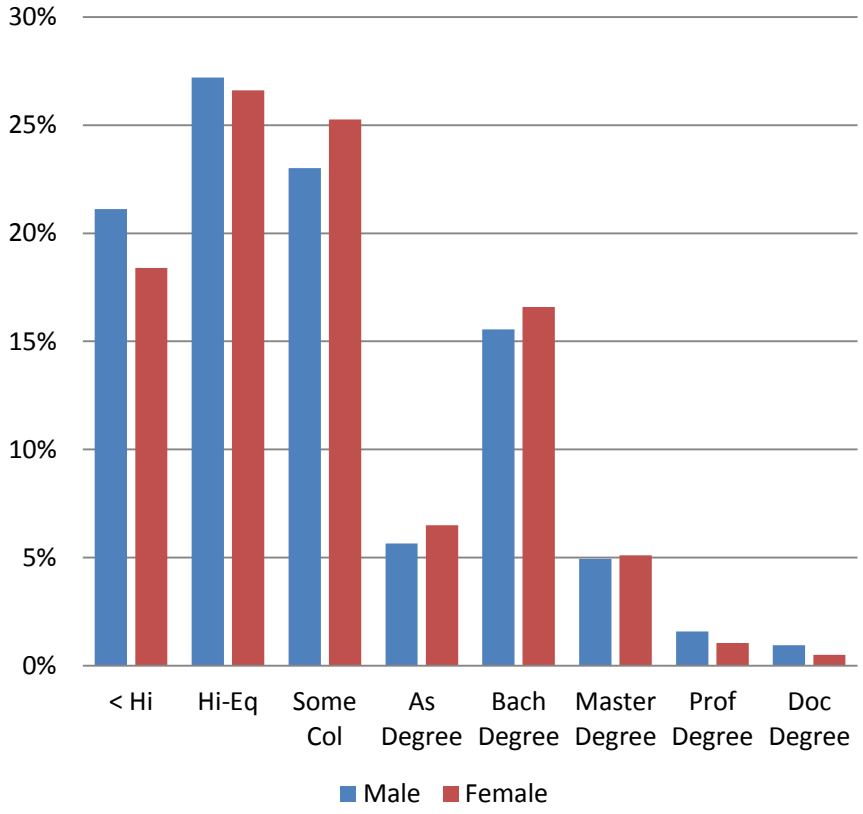


Source: U.S. Census Bureau. 2001 to 2010 American Community Survey 1-Year PUMS data

Background

Educational attainment improvements seen among most subgroups, but demographic differences are still pronounced.

Educational Attainment Level for Persons Age 18 -64
ACS PUMS 5-year, 2006-2010



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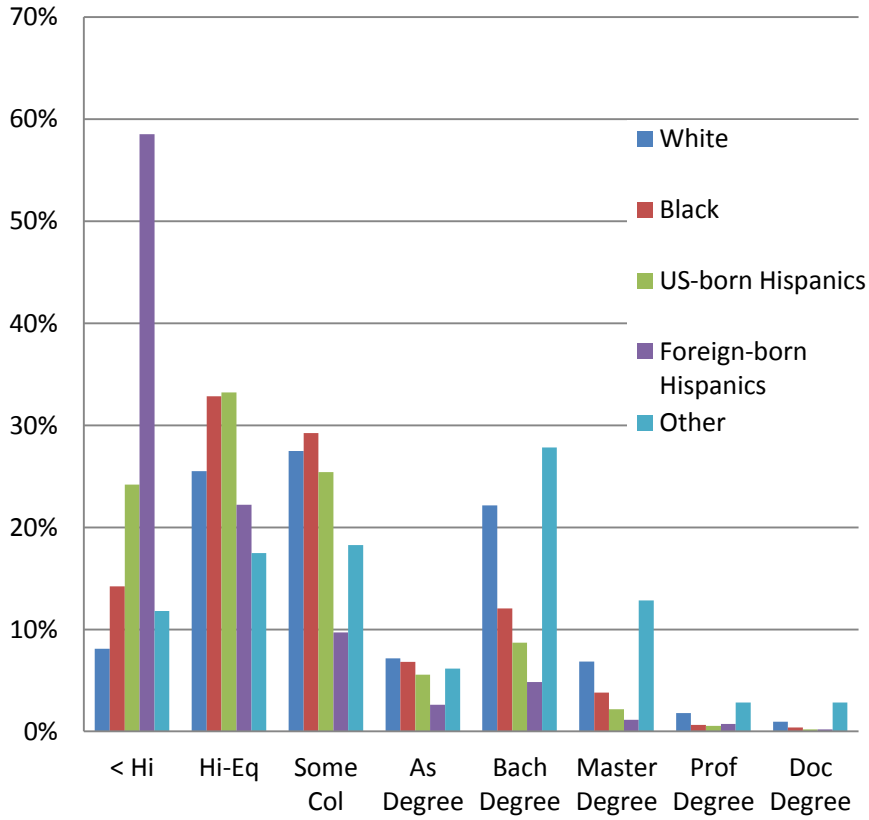

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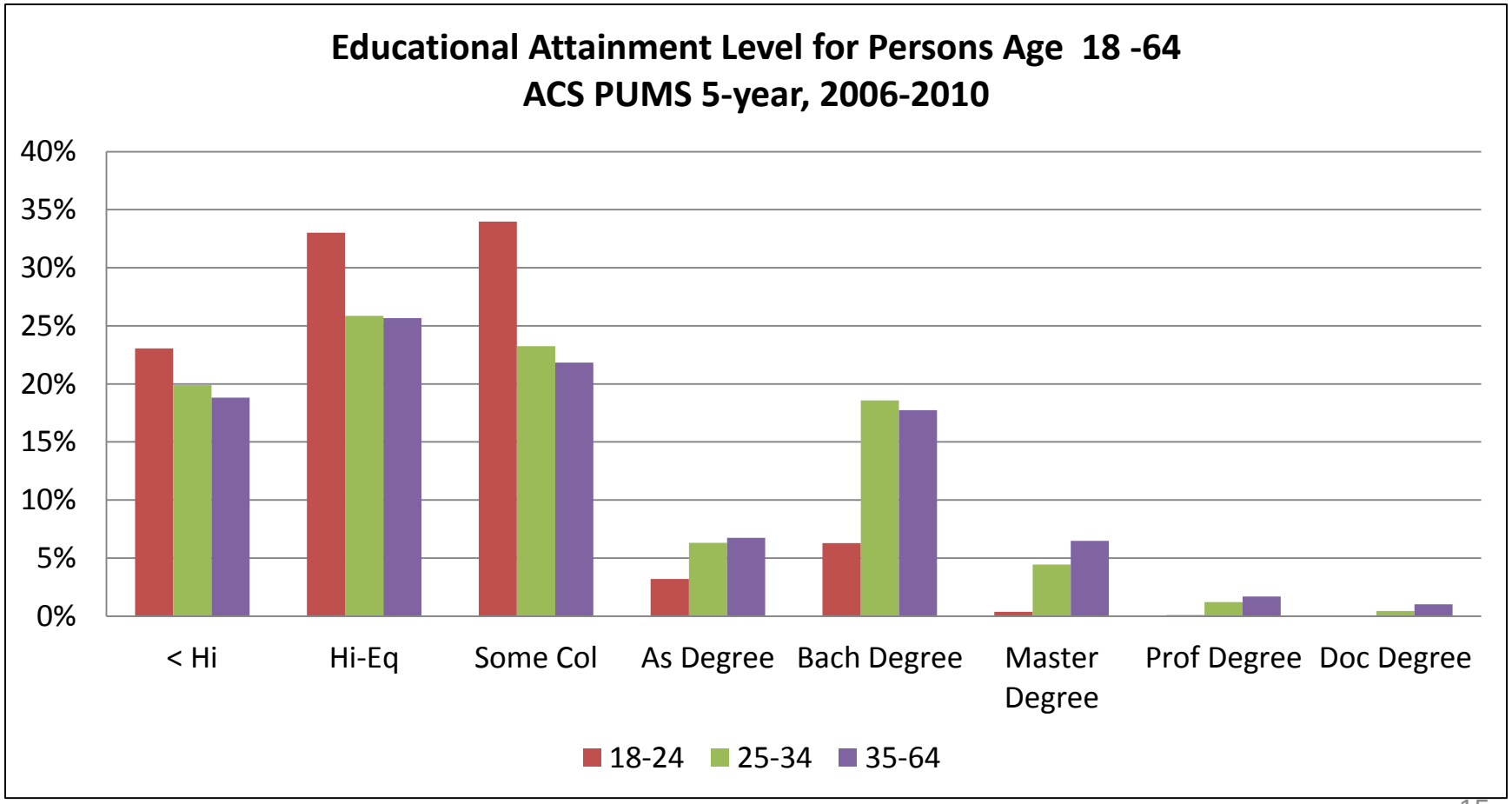


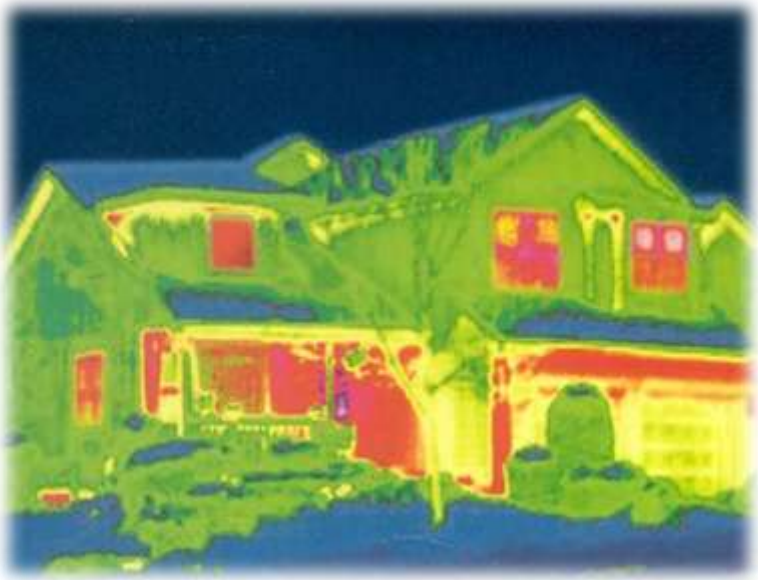
Data & Methods

- Data sources:
  - American Community Survey PUMS data 2001 to 2010
  - Texas State Data Center population projections data
  - Texas Workforce Commission occupation-education projection data
- Analysis plan
  - Multinomial regression model used to predict the rates of each educational attainment category for each demographic sub-group, based on historical trend and demographic characteristics
  - The predicted sub-group specific rates are applied to the population projections

Findings

- Compare projected educational attainment of the labor force to required labor force for projected job needs
- Identify gaps between demand (by job type) for education and the supply (by the labor force)
- Specific educational attainment levels and population sub-groups can then be targeted to meet these needs
  - Tailored career paths in high schools, colleges, and vocational schools
  - Inform immigration goals for specific skill visas
  - Evaluate funding needed to meet goals of projected education levels needed in the labor force

Identifying demographic, socioeconomic, geospatial, and housing unit characteristics that are related to household energy consumption



Data & Methods

- Identified variables related to energy consumption
- Data sources:
  - Energy provider consumption data
  - Census data
  - County appraisal district data

Housing Characteristics

- Year built
- Square footage
- Type of foundation
- Number of rooms
- Number of stories
- Presence of a pool
- Presence of a fireplace

Demographic & Socioeconomic Characteristics

- Total population
- Total occupied housing units
  - Owner occupied
  - Renter occupied
- Percent Hispanic, non-Hispanic householders
- Mean age of householder
- Number of persons per household
- Family composition
- Educational attainment of householder
- Households with children under 6
- Households with seniors
- Median household income

Behavioral Characteristics

- Participated in rebate program
- Installed a smart thermostat

Data & Methods

- Analysis plan
  - Regression analysis to determine most relevant predictor variables
- Addressing challenges with data
  - Differing units of analysis
  - Geocoding and matching data

Findings

- Identify factors most important to high/low energy consumption
- Identify homes with relatively high energy consumption
- Target homes that could benefit from upgrades, receipt of rebates
- Identify hot spots in the city in need of large scale retrofitting

Estimating the number of unauthorized immigrants in Texas counties

Background

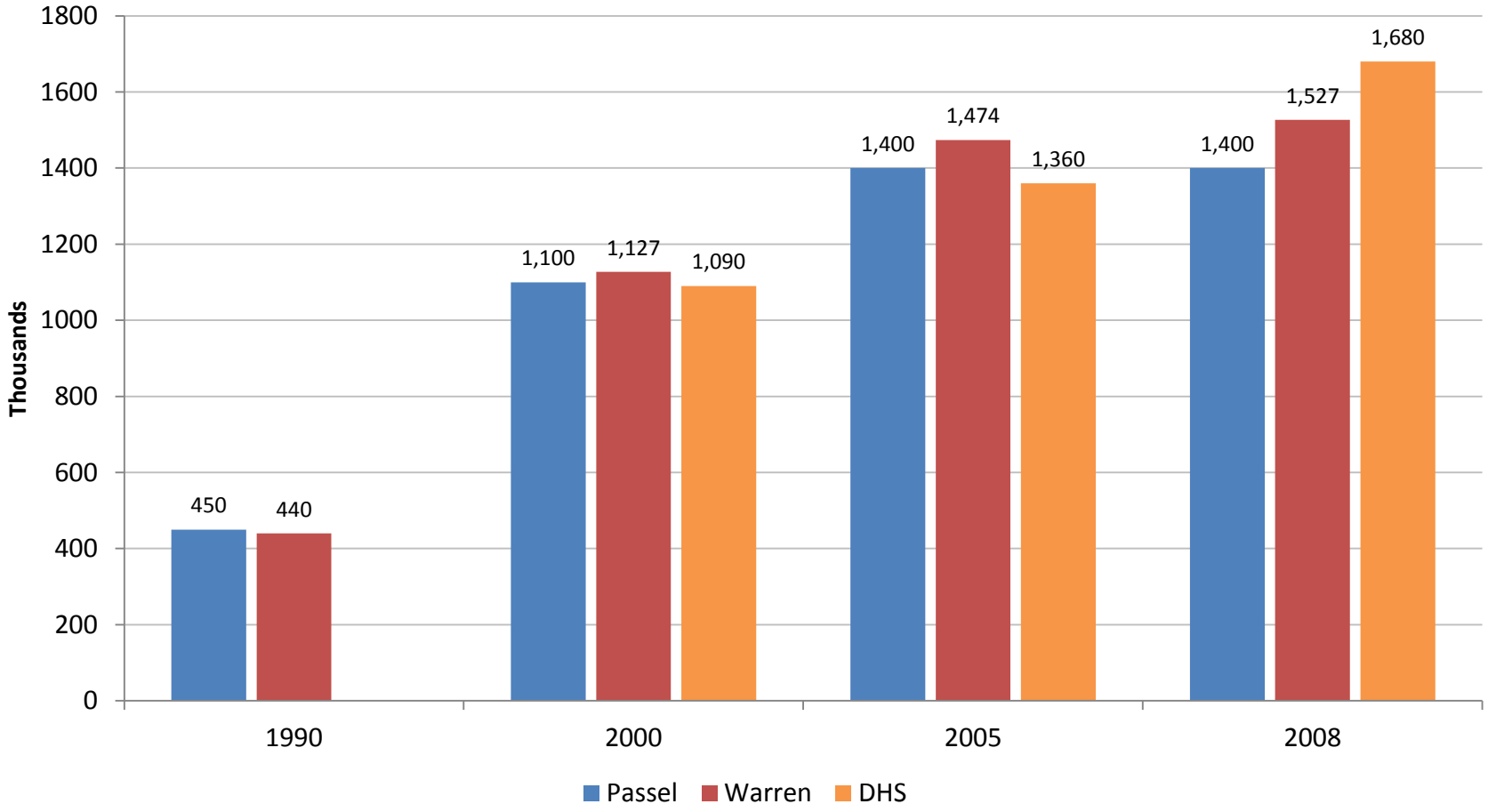
- Texas is one of the fastest growing states, with migration making up 45% of growth
- Issue of immigration, especially unauthorized or illegal migration, critical when planning and considering:
  - Concerns about border security
  - Assessments of economic impact on receiving communities
  - Resulting shifts in the social characteristics of communities
- With the exception of California, sub-state level estimates of the undocumented population are not available.

Background

- Conventionally, estimation of the undocumented population produced using the residual method (Warren 2011; Passel 2010, 2011)
  - Estimates of legal foreign born residents are subtracted from estimates of foreign born
- Most commonly used national and state estimates include Pew Hispanic Center, Dept. of Homeland Security, and R. Warren estimates

- Residual method produces some challenges when attempting to produce estimates at lower geographies due to data unavailability

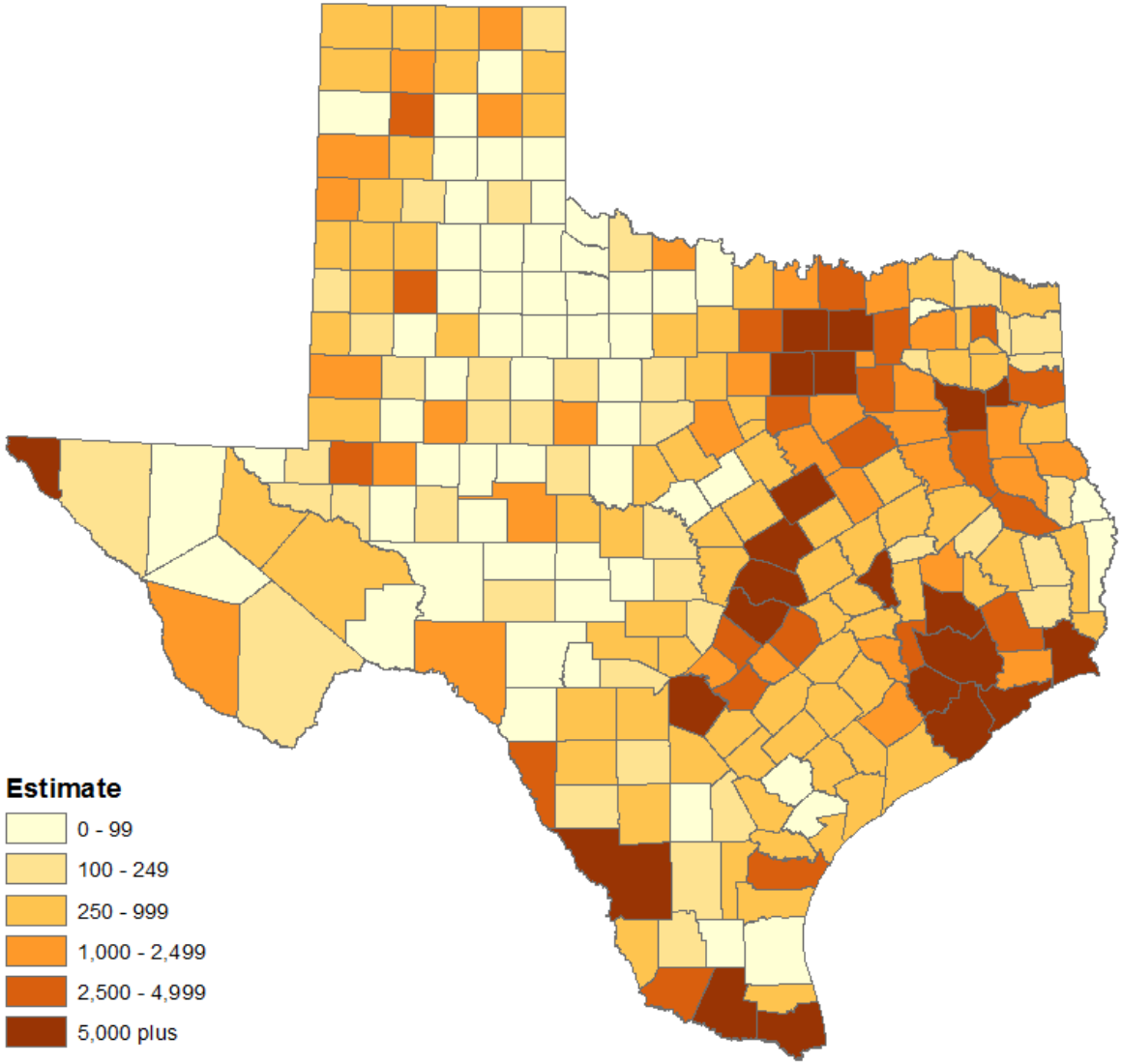
Estimates of the Unauthorized Immigrant Population in Texas



Data & Methods

- New county level IRS administrative data allows for reallocation of state estimates of the unauthorized to the county level
- Use regression analysis to account for varying use of ITINs by unauthorized immigrant population
- Expand upon this new estimation technique by employing geographically weighted regression to refine the distribution of unauthorized immigrants across the state

Estimates of the Unauthorized Immigrant Population, 2008



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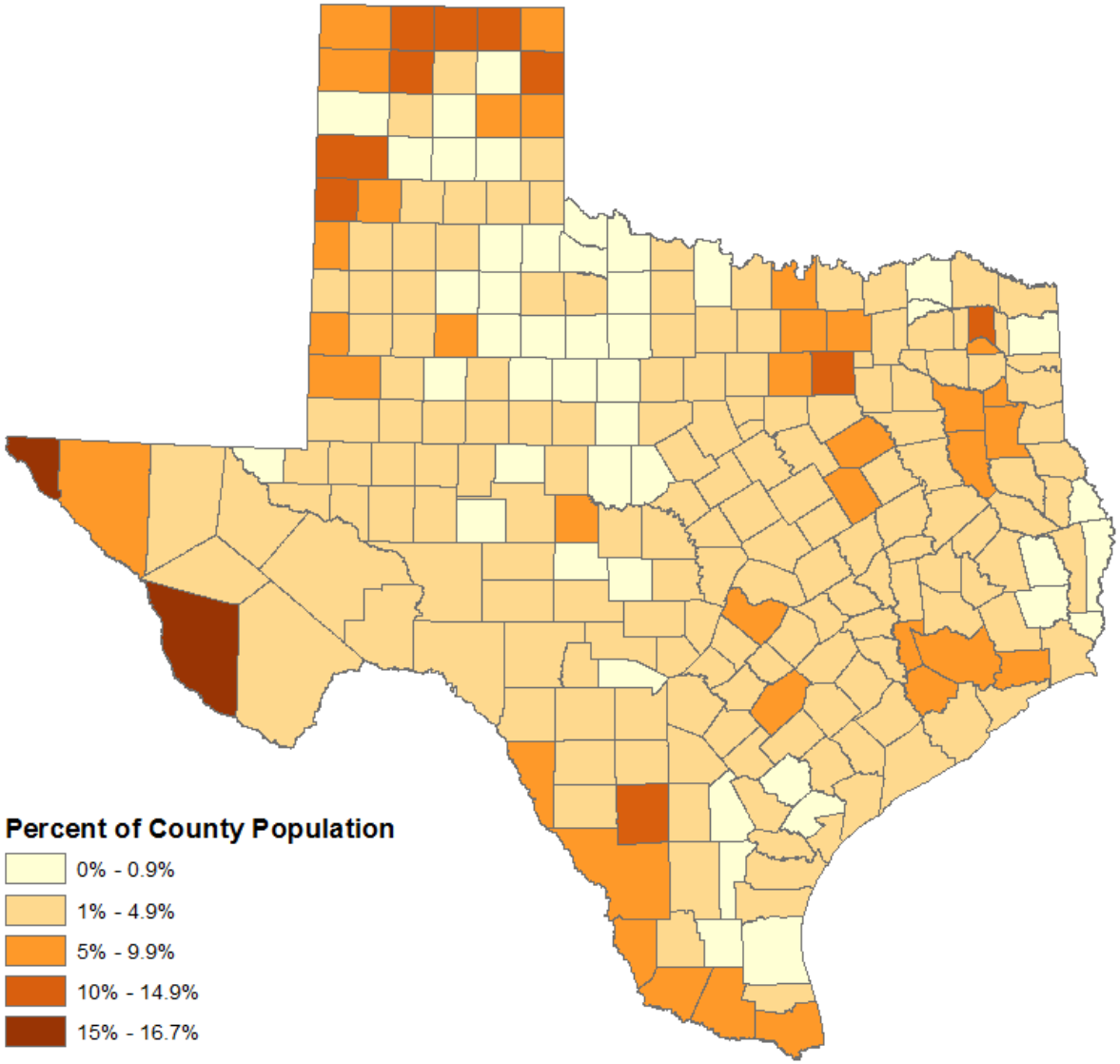

Results

- Higher unauthorized estimates were found in counties characterized by agriculture, urbanicity, high employment, fast Hispanic population growth, and substantial foreign born populations
- These areas include counties in the Dallas-Fort Worth-Arlington, Houston-Baytown-Sugarland, and Austin-Round Rock metropolitan areas, large border counties, and counties in parts of East Texas.
- When examined as a percentage of the county population, Panhandle counties and counties in the Dallas and border areas have higher percentages.

Demographics & Destiny

Hans Rosling’s The Joy of Stats BBC Four

http://youtu.be/jbkSRLYSojo

Contact

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